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# Report On

FCC Testing of the  
Ericsson DOT 4469 B48, KRY 901 516/2, Dot 4459 B48, KRY 901  
516/1, NR, NR + LTE (3550-3700 MHz) Base Station in accordance  
with FCC CFR 47 Part 2 and FCC CFR 47 Part 96

COMMERCIAL-IN-CONFIDENCE

FCC: TA8AKRY901516-1, TA8AKRY901516-2

PREPARED BY

Handwritten signature of Glen Westwell.

Glen Westwell  
Senior Test Engineer

APPROVED BY

Handwritten signature of Scott Drysdale.

Scott Drysdale  
Authorised Signatory

DATED

17 - Sept - 2023

Document 7169013364 Report 01 Issue 2

11-September-2023



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## **SECTION 1**

### **REPORT INFORMATION**



## 1.1 REPORT DETAILS

Manufacturer	Ericsson
Address	Torshamnsgatan 23 Kista SE-16480 Stockholm Sweden
Product Name & Product Number	DOT 4469 B48 - KRY 901 516/2
Serial Number(s)	TD3W213280
Software Version	CXP2030045/26 Revision R17B483
Hardware Version	R1A
Non-Tested Variant (See Section 1.11 Additional Information)	DOT 4459 B48 - KRY 901 516/1
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2022 FCC CFR 47 Part 96: 2021
Test Plan	Dot 4469 B48_RA-FCC_testplan - adding NR10 and NR15 (for TUV SUD)
Start of Test	31-July-2023
Finish of Test	2-August-2023
Name of Engineer(s)	Glen Westwell
Related Document(s)	KDB 971168 D01 v02r02 KDB 662911 D01 v02r01 ANSI C63.26-2015

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### ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate compliance with and FCC CFR 47 Part 2: 2022 and FCC CFR 47 Part 96: 2021. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

---

Glen Westwell



## 1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 96 and is shown below.

Section	Specification Clause		Test Description	Result
	FCC CFR 47 Part 2	FCC CFR 47 Part 96		
2.1	2.1046	96.41 (b)(c)(g)	Peak Output Power and Peak to Average Ratio - Conducted	Pass
2.2	2.1049	96.41 (e)(3)	Occupied Bandwidth	Pass
2.3	2.1051	96.41 (e)(3)	Band Edge	Pass
2.4	2.1051	96.41 (e)(1)	Transmitter Spurious Emissions	Pass



### 1.3 TEST RATIONALE

The tests that have been selected are detailed in the customer Test Plan as defined in section 1.1 of this report.



#### 1.4 CONFIGURATION DESCRIPTION

Configuration A					
RAT	No. of Carriers	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR	1	10 MHz	3555.0	3625.0	3695.0
		15 MHz	3557.5	3625.0	3692.5

Configuration B					
RAT	No. of Carriers	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR	2	10+10 MHz	3555.0+3565.0	3620.0+3630.0	3685.0+3695.0
		15+15 MHz	3557.5+3572.5	3617.5+3632.5	3677.5+3692.5
*NR	2	10+10 MHz	3555.0	-	3695.0
		15+15 MHz	3557.5	-	3692.5
NR+LTE	2	10+10 MHz	3555.0+3565.0	3620.0+3630.0	3685.0+3695.0
*NR+LTE	2	10+10 MHz	3555.0	-	3695.0

Configuration C					
RAT	No. of Carriers	Carrier BW	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR	12	10 MHz	3555.0+3565.0+3575.0+3585.0+3595.0+3605.0+3615.0+3625.0+3635.0+3645.0+3655.0+3665.0	3570.0+3580.0+3590.0+3600.0+3610.0+3620.0+3630.0+3640.0+3650.0+3660.0+3670.0+3680.0	3585.0+3595.0+3605.0+3615.0+3625.0+3635.0+3645.0+3655.0+3665.0+3675.0+3685.0+3695.0
*NR	12	10 MHz	3555.0+3565.0+3575.0+3585.0+3595.0+3605.0	-	3645.0+3655.0+3665.0+3675.0+3685.0+3695.0
6NR+6LTE	12	10 MHz	3555.0+3565.0+3575.0+3585.0+3595.0+3605.0+3615.0+3625.0+3635.0+3645.0+3655.0+3665.0	3570.0+3580.0+3590.0+3600.0+3610.0+3620.0+3630.0+3640.0+3650.0+3660.0+3670.0+3680.0	3585.0+3595.0+3605.0+3615.0+3625.0+3635.0+3645.0+3655.0+3665.0+3675.0+3685.0+3695.0
*6NR+6LTE	12	10 MHz	3555.0+3565.0+3575.0+3585.0+3595.0+3605.0	-	3645.0+3655.0+3665.0+3675.0+3685.0+3695.0

\*= Non-Contiguous Configuration.



1.5 DECLARATION OF BUILD STATUS

<b>MAIN EUT</b>	
<b>MANUFACTURING DESCRIPTION</b>	Radio Dot
<b>MANUFACTURER</b>	Ericsson
<b>TYPE</b>	Remote Radio Base Station
<b>PART NUMBER</b>	KRY 901 516/1 and KRY 901 516/2
<b>SERIAL NUMBER</b>	TD3W213280 for conducted measurement TD3W262402 for radiated measurement
<b>HARDWARE VERSION</b>	R1A
<b>SOFTWARE VERSION</b>	CXP 203 0045/26 - R17B483
<b>TRANSMITTER OPERATING RANGE</b>	3550 – 3700 MHz
<b>RECEIVER OPERATING RANGE</b>	3550 – 3700 MHz
<b>COUNTRY OF ORIGIN</b>	China
<b>INTERMEDIATE FREQUENCIES</b>	None
<b>EMISSION DESIGNATOR(S): (i.e. G1D, GXW)</b>	LTE: 5M00W7D, 10M0W7D, 20M0W7D NR: 10M0F9W, 15M0F9W, 20M0F9W, 30M0F9W, 40M0F9W, 50M0F9W, 60M0F9W, 70M0F9W, 80M0F9W, 90M0F9W, 100MF9W
<b>MODULATION TYPES: (i.e. GMSK, QPSK)</b>	LTE: QPSK, 16QAM, 64QAM, 256QAM NR: QPSK, 16QAM, 64QAM, 256QAM
<b>HIGHEST INTERNALLY GENERATED FREQUENCY</b>	3.7 GHz
<b>OUTPUT POWER (W or dBm)</b>	4 x 0.4W (26dBm)
<b>Antenna gain (dBi)</b>	5.29 dBi
<b>FCC ID</b>	TA8AKRY901516-1 & TA8AKRY901516-2
<b>INDUSTRY CANADA ID</b>	NA
<b>TECHNICAL DESCRIPTION (a brief description of the intended use and operation)</b>	The Dot 4459 B48 (KRY 901 516/1) and the Dot 4469 B48 (KRY 901 516/2) are Remote Radio Units forming part of the Ericsson Radio Base Station (RBS) equipment. The Dot provides radio access for mobile and fixed devices and is intended for the indoor environment. The radio operates over 4 Transmit ports in MRO (NR+LTE); Single, Multi-Carrier, and MIMO transmission with a maximum rated RF Output of 0.4W per port over an operational temperature of 5°C to +40°C. The unit is designed to be ceiling or wall mounted. The 4459 and 4469 radios are identical except that Dot 4459 has internal antennas and Dot 4469 has external ports.





**Signature:**

A handwritten signature in blue ink, appearing to be 'DL' or similar initials, written over a dotted line.

**Denis Lalonde**  
**Date: 1 September 2023**  
**Declaration of Build Status Serial Number: TD3W213280**

## 1.6 PRODUCT INFORMATION

### 1.6.1 Technical Description

The Equipment Under Test (EUT) DOT 4469 B48 - KRY 901 516/2 is an Ericsson AB Radio Unit working in the public mobile service Band 48 band which provides communication connections to Band 48 network.

The EUT is declared as operating from a nominal -48V DC supply.

The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.

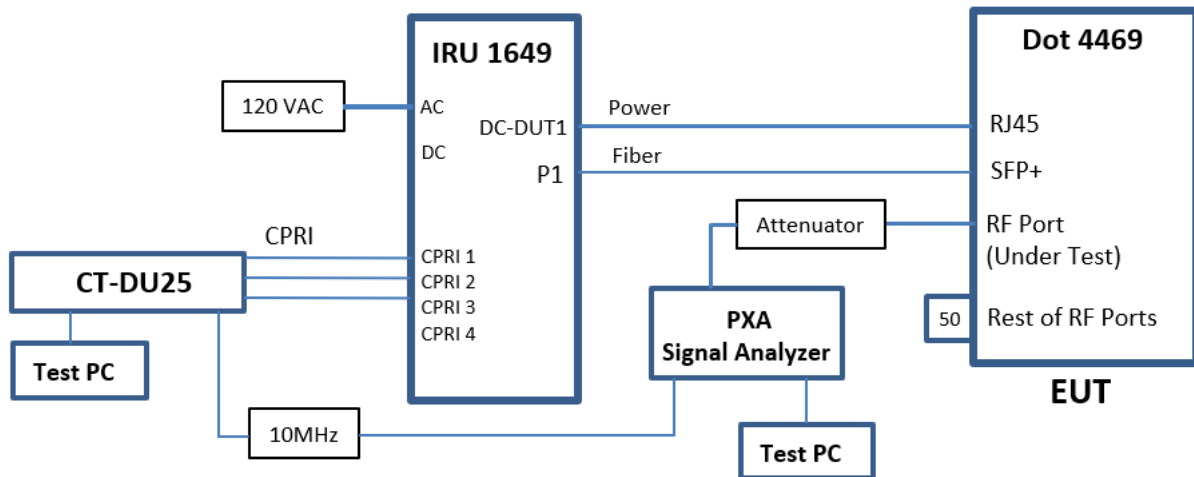
Equipment Under Test



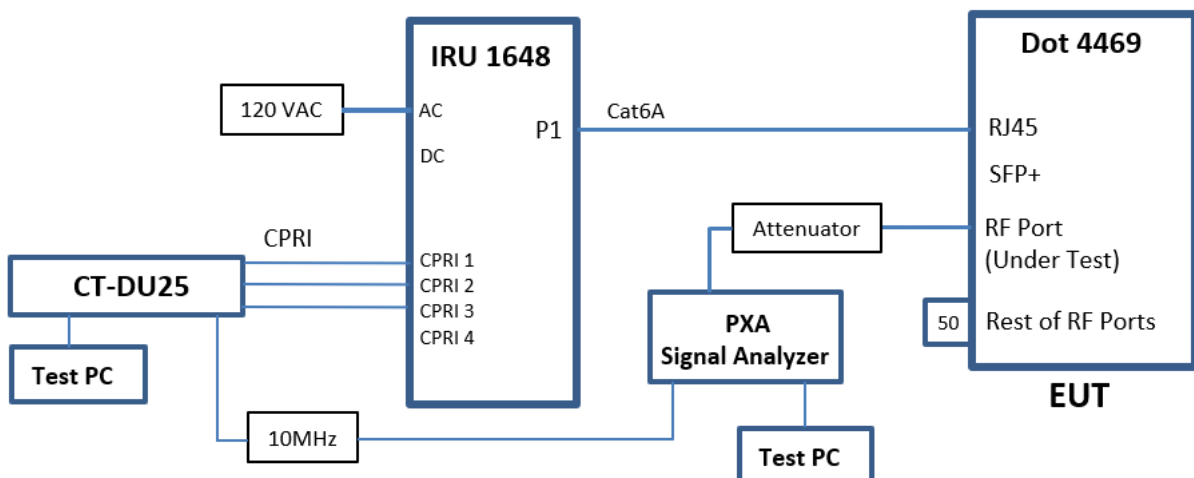


## 1.7 TEST SETUP

### Conducted Test Set Up – Non Contiguous



### Conducted Test Set Up – Contiguous





## 1.8 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated as described in the Test Method for each Test.

The EUT was powered from a -48V DC supply unless otherwise stated.

FCC Measurement Facility Registration Number  
CA4810 TUV SUD Canada, 1280 Teron Rd., Kanata On.

Under our A2LA Accreditation, TÜV SÜD Canada conducted the following tests Ericsson, Ottawa Laboratory: 349 Terry Fox Dr, Kanata, ON.

Test Name	Name of Engineer(s)
Peak Output Power and Peak to Average Ratio - Conducted	Glen Westwell
Occupied Bandwidth	Glen Westwell
Band Edge	Glen Westwell
Transmitter Spurious Emissions	Glen Westwell

## 1.9 DEVIATION FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

## 1.10 MODIFICATION RECORD

No modifications were made to the EUT during testing.

## 1.11 ADDITIONAL INFORMATION

1. This filing is for a Class 2 Permissive change for Radio Certification for use in the USA under the following ID's:

FCC ID: TA8AKRY901516-1 & TA8AKRY901516-2

2. Transmitter performance was measured for top, mid & bottom channels for contiguous and non-contiguous (NC) operation, where applicable, across all antenna ports as presented in the power measurement tables. Typical performance is presented. All configuration data is on file and available upon request.

3. The Dot 4459 B48 and Dot 4469 B48 radios are identical except that Dot 4459 has internal antennas and Dot 4469 has external RF ports.



## **SECTION 2**

### **TEST DETAILS**



**2.1 PEAK OUTPUT POWER AND PEAK TO AVERAGE RATIO - CONDUCTED**

**2.1.1 Specification Reference**

FCC CFR 47 Part 96, Clause 96.41 (b)(c)(g)  
 FCC CFR 47 Part 2, Clause 2.1046

**2.1.2 Date of Test and Modification State**

31 July and 01-August-2023 - Modification State 0

**2.1.3 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

**2.1.4 Environmental Conditions**

Ambient Temperature 24.6°C  
 Relative Humidity 30.8%

**2.1.5 Test Method**

All measurements were made in accordance with FCC KDB 971168 D01, clause 5.2.1 and summed in accordance with FCC KDB 662911 D01.

**2.1.6 Test Results**

Configuration A

Maximum Output Power (EIRP): 30dBm/10 MHz  
 Maximum PSD (EIRP): 20 dBm/MHz

Antenna Gain (dBi)	Modulation	Carrier Bandwidth (MHz)	Peak to Average Ratio (PAR) / PSD / Output Power				
			Channel Position B				
CCDF			PSD (T <sub>E,I,R,P</sub> )	Average Power			
Antenna Port			PAR (dB)	dBm/MHz	dBm	dBm / 10 MHz	EIRP dBm/10 MHz
5.29							
A	NR: QPSK	10.0	-	RE	18.42	18.42	23.71
B	NR: QPSK	10.0	-	RE	18.35	18.35	23.64
C	NR: QPSK	10.0	9.57	RE	18.41	18.41	23.70
D	NR: QPSK	10.0	-	RE	18.60	18.60	23.89
Total			-	18.9	24.47	24.47	29.76
A	NR: QPSK	15.0	9.57	8.41	19.38	17.62	22.91
B	NR: QPSK	15.0	-	8.63	19.51	17.75	23.04
C	NR: QPSK	15.0	-	8.71	19.50	17.74	23.03
D	NR: QPSK	15.0	-	8.82	19.81	18.05	23.34
Total			-	19.96	25.57	23.81	29.10

Note: RE = Radiated emission data entered for the total PSD (EIRP), as the conducted composite PSD was slightly over the 20dBm/MHz requirement.



Antenna Gain (dBi)	Modulation	Carrier Bandwidth (MHz)	Peak to Average Ratio (PAR) / PSD / Output Power				
			Channel Position M				
CCDF			PSD (T <sub>EIRP</sub> )	Average Power			
5.29	Antenna Port	PAR (dB)	dBm/MHz	dBm	dBm / 10 MHz	EIRP dBm/10 MHz	
A	NR: QPSK	10.0	-	8.40	17.68	17.68	22.97
B	NR: QPSK	10.0	-	8.79	18.06	18.06	23.35
C	NR: QPSK	10.0	-	8.59	17.91	17.91	23.20
D	NR: QPSK	10.0	9.48	8.63	17.85	17.85	23.14
Total			-	19.92	23.90	23.90	29.19
A	NR: QPSK	15.0	-	7.88	19.18	17.42	22.71
B	NR: QPSK	15.0	-	8.03	19.49	17.73	23.02
C	NR: QPSK	15.0	-	7.81	19.24	17.48	22.77
D	NR: QPSK	15.0	9.69	7.91	19.01	17.25	22.54
Total			-	19.22	25.25	23.49	28.78

Antenna Gain (dBi)	Modulation	Carrier Bandwidth (MHz)	Peak to Average Ratio (PAR) / PSD / Output Power				
			Channel Position T				
CCDF			PSD (T <sub>EIRP</sub> )	Average Power			
5.29	Antenna Port	PAR (dB)	dBm/MHz	dBm	dBm / 10 MHz	EIRP dBm/10 MHz	
A	NR: QPSK	10.0	-	8.27	17.50	17.50	22.79
B	NR: QPSK	10.0	-	8.55	17.77	17.77	23.06
C	NR: QPSK	10.0	-	8.42	17.77	17.77	23.06
D	NR: QPSK	10.0	9.75	8.36	17.64	17.64	22.93
Total			-	19.71	23.69	23.69	28.98
A	NR: QPSK	15.0	-	7.59	18.70	16.94	22.23
B	NR: QPSK	15.0	-	7.78	18.89	17.13	22.42
C	NR: QPSK	15.0	-	7.61	18.81	17.05	22.34
D	NR: QPSK	15.0	9.07	7.64	18.94	17.18	22.47
Total			-	18.96	24.86	23.10	28.39

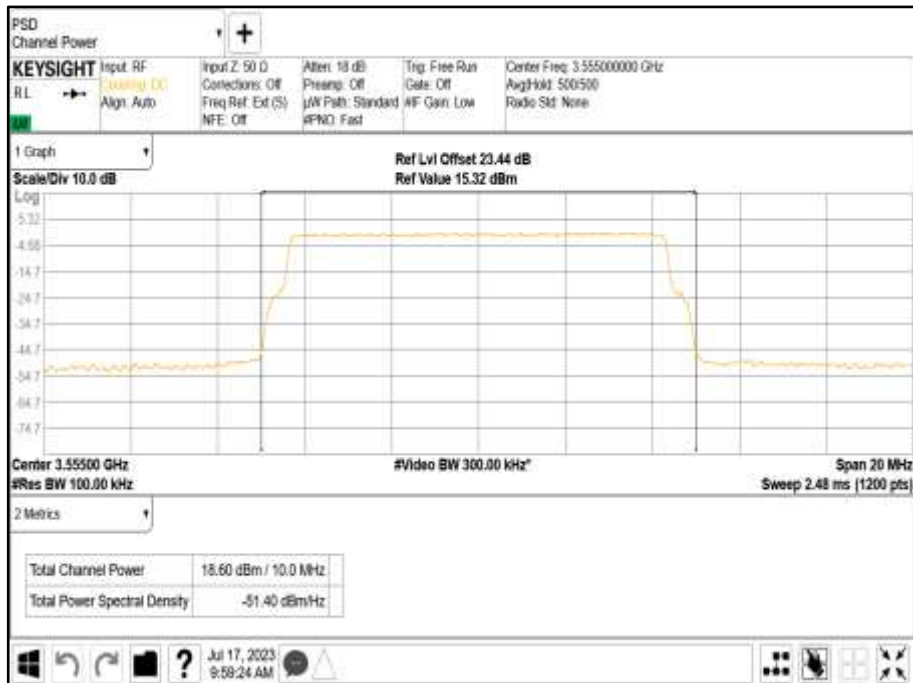
Antenna Gain (dBi)	Modulation	Carrier Bandwidth (MHz)	Average Output Power					
			Channel Position					
Bottom			Mid		Top			
5.29	Antenna Port	dBm	dBm (EIRP)	dBm	dBm (EIRP)	dBm	dBm (EIRP)	
A	NR: QPSK	10.0	18.42	23.71	17.68	22.97	17.50	22.79
B	NR: QPSK	10.0	18.35	23.64	18.06	23.35	17.77	23.06
C	NR: QPSK	10.0	18.41	23.70	17.91	23.20	17.77	23.06
D	NR: QPSK	10.0	18.60	23.89	17.85	23.14	17.64	22.93
Total			24.47	29.76	23.90	29.19	23.69	28.98
A	NR: QPSK	15.0	19.38	24.67	19.18	24.47	18.70	23.99
B	NR: QPSK	15.0	19.51	24.80	19.49	24.78	18.89	24.18
C	NR: QPSK	15.0	19.50	24.79	19.24	24.53	18.81	24.10
D	NR: QPSK	15.0	19.81	25.10	19.01	24.30	18.94	24.23
Total			25.57	30.86	25.25	30.54	24.86	30.15



## Remarks

1. Transmitter performance has been presented for top, mid, bottom channels across all antenna ports as represented in the following tables.
2. Typical performance and measurement plot data has been presented for reference.
3. All contiguous and non-contiguous (NC) plot data is on file and available upon request.
4. The worst-case result for the peak-to-average ratio (CCDF) & the power spectral density (PSD) has been presented for comparison to the limits. The Total PSD (dBm/MHz) result incorporates 4 x the worst-case PSD results plus the antenna gain representing a final EIRP result.
5. Bottom Channel PSD/MHz was slightly over using conducted measurements. These were re-measured using a radiated measurement to prove compliant results.

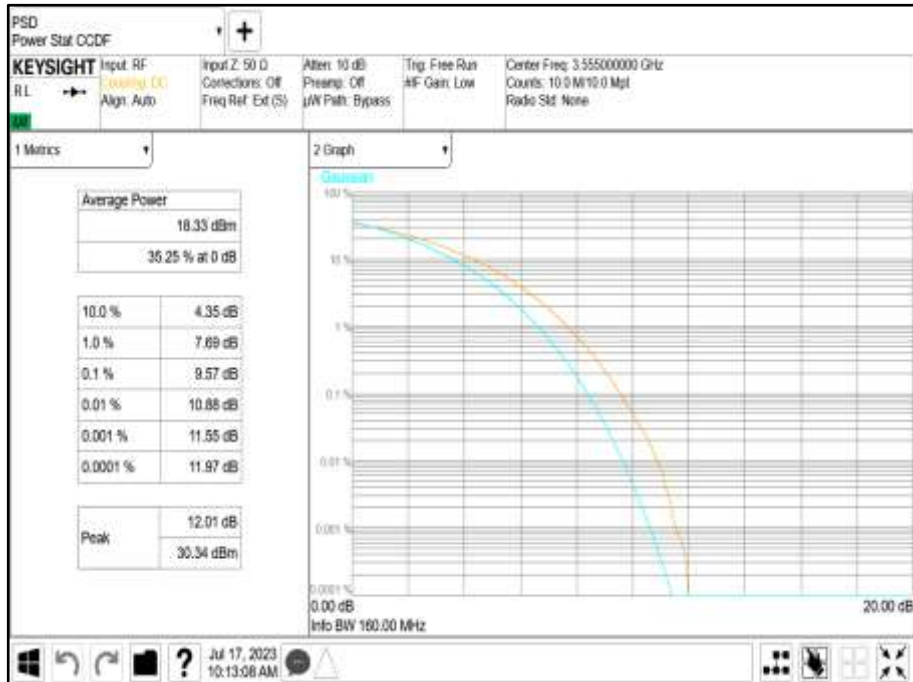
## Antenna Port D Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B







Antenna Port D Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B



Antenna Port D PSD - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B

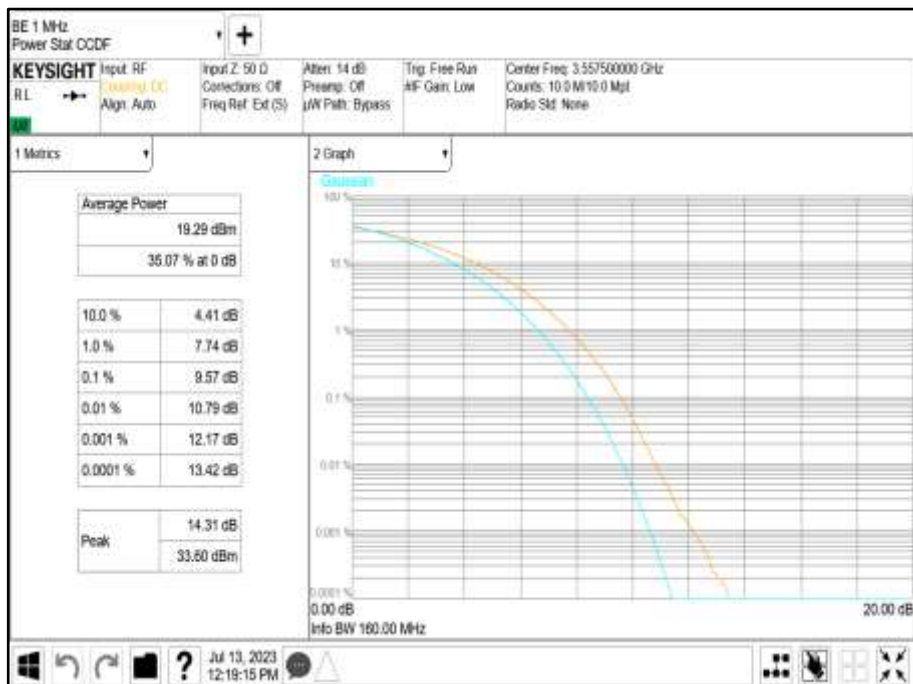
\*This measurement was performed as a radiated measurement as per the table above.



Antenna Port D Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B

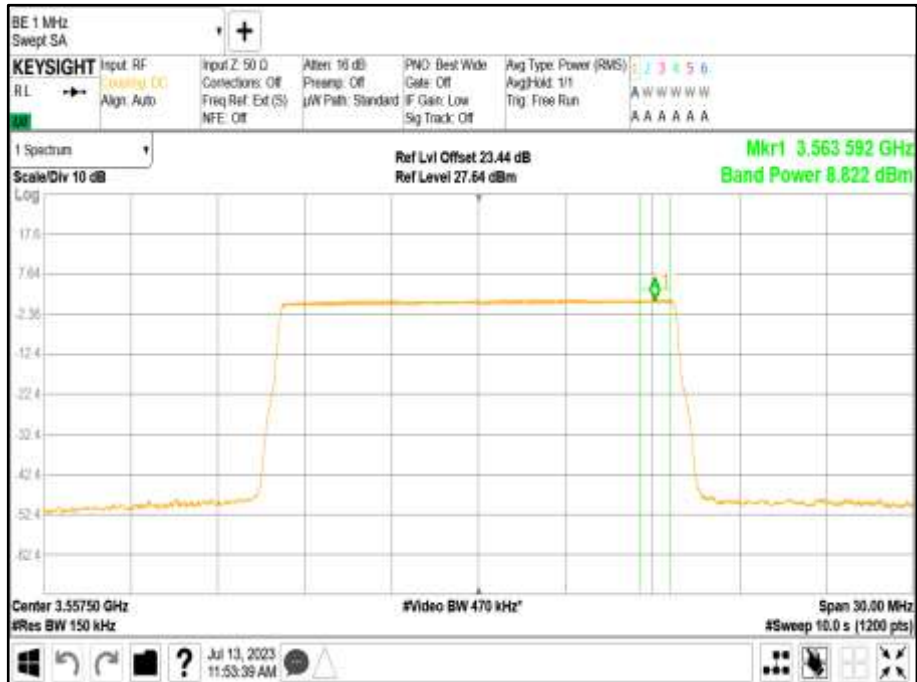


Antenna Port D Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B





Antenna Port D PSD - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B





Configuration B

Maximum Output Power (EIRP): 30dBm/10 MHz

Antenna Gain (dBi)	Modulation	Carrier Bandwidth	PSD / Output Power		
5.29			Channel Position B		
Antenna Port			dBm	dBm / 10 MHz	EIRP dBm/10 MHz
A	NR: QPSK	10.0+10.0 MHz	20.40	17.39	22.68
B	NR: QPSK	10.0+10.0 MHz	20.57	17.56	22.85
C	NR: QPSK	10.0+10.0 MHz	20.67	17.66	22.95
D	NR: QPSK	10.0+10.0 MHz	20.67	17.66	22.95
Total			26.60	23.59	28.88
A	NR: QPSK	15.0+15.0 MHz	22.20	17.43	22.72
B	NR: QPSK	15.0+15.0 MHz	22.34	17.57	22.86
C	NR: QPSK	15.0+15.0 MHz	22.41	17.64	22.93
D	NR: QPSK	15.0+15.0 MHz	22.40	17.63	22.92
Total			28.36	23.59	28.88
A	* NR: QPSK	10.0+10.0 MHz	18.86	15.85	21.14
B	* NR: QPSK	10.0+10.0 MHz	18.96	15.95	21.24
C	* NR: QPSK	10.0+10.0 MHz	19.20	16.19	21.48
D	* NR: QPSK	10.0+10.0 MHz	19.10	16.09	21.38
Total			25.05	22.04	27.33
A	* NR: QPSK	15.0+15.0 MHz	20.43	15.66	20.95
B	* NR: QPSK	15.0+15.0 MHz	20.80	16.03	21.32
C	* NR: QPSK	15.0+15.0 MHz	20.62	15.85	21.14
D	* NR: QPSK	15.0+15.0 MHz	20.76	15.99	21.28
Total			26.68	21.90	27.19
A	NR+LTE: QPSK	10.0+10.0 MHz	19.90	16.89	22.18
B	NR+LTE: QPSK	10.0+10.0 MHz	19.86	16.85	22.14
C	NR+LTE: QPSK	10.0+10.0 MHz	19.97	16.96	22.25
D	NR+LTE: QPSK	10.0+10.0 MHz	20.01	17.00	22.29
Total			25.96	22.95	28.24
A	* NR+LTE: QPSK	10.0+10.0 MHz	18.93	15.92	21.21
B	* NR+LTE: QPSK	10.0+10.0 MHz	18.90	15.89	21.18
C	* NR+LTE: QPSK	10.0+10.0 MHz	18.95	15.94	21.23
D	* NR+LTE: QPSK	10.0+10.0 MHz	18.92	15.91	21.20
Total			24.95	21.94	27.23



Antenna Gain (dBi)	Modulation	Carrier Bandwidth	PSD / Output Power		
			Channel Position M		
5.29			dBm	dBm / 10 MHz	EIRP dBm/10 MHz
Antenna Port					
A	NR: QPSK	10.0+10.0 MHz	20.00	16.99	22.28
B	NR: QPSK	10.0+10.0 MHz	20.29	17.28	22.57
C	NR: QPSK	10.0+10.0 MHz	20.14	17.13	22.42
D	NR: QPSK	10.0+10.0 MHz	20.26	17.25	22.54
Total			26.19	23.18	28.47
A	NR: QPSK	15.0+15.0 MHz	21.98	17.21	22.50
B	NR: QPSK	15.0+15.0 MHz	21.95	17.18	22.47
C	NR: QPSK	15.0+15.0 MHz	21.89	17.12	22.41
D	NR: QPSK	15.0+15.0 MHz	21.94	17.17	22.46
Total			27.96	23.19	28.48
A	NR+LTE: QPSK	10.0+10.0 MHz	19.45	16.44	21.73
B	NR+LTE: QPSK	10.0+10.0 MHz	19.59	16.58	21.87
C	NR+LTE: QPSK	10.0+10.0 MHz	19.47	16.46	21.75
D	NR+LTE: QPSK	10.0+10.0 MHz	19.58	16.57	21.86
Total			25.54	22.53	27.82

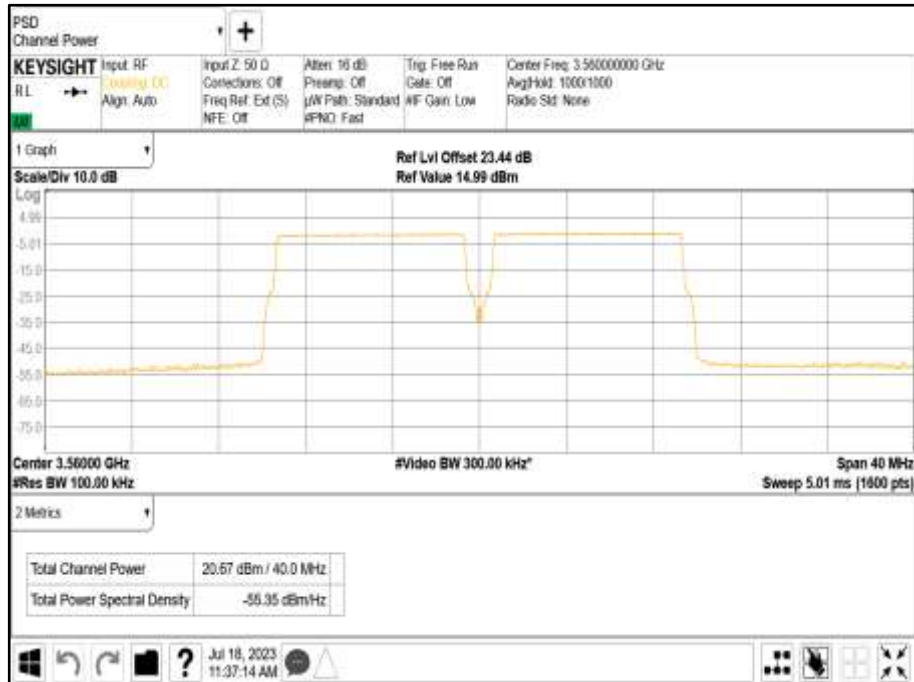
Antenna Gain (dBi)	Modulation	Carrier Bandwidth	PSD / Output Power		
			Channel Position T		
5.29			dBm	dBm / 10 MHz	EIRP dBm/10 MHz
Antenna Port					
A	NR: QPSK	10.0+10.0 MHz	19.81	16.80	22.09
B	NR: QPSK	10.0+10.0 MHz	20.11	17.10	22.39
C	NR: QPSK	10.0+10.0 MHz	19.99	16.98	22.27
D	NR: QPSK	10.0+10.0 MHz	20.05	17.04	22.33
Total			26.01	23.00	28.29
A	NR: QPSK	15.0+15.0 MHz	21.57	16.80	22.09
B	NR: QPSK	15.0+15.0 MHz	21.83	17.06	22.35
C	NR: QPSK	15.0+15.0 MHz	21.69	16.92	22.21
D	NR: QPSK	15.0+15.0 MHz	21.81	17.04	22.33
Total			27.75	22.98	28.27
A	NR+LTE: QPSK	10.0+10.0 MHz	19.27	16.26	21.55
B	NR+LTE: QPSK	10.0+10.0 MHz	19.46	16.45	21.74
C	NR+LTE: QPSK	10.0+10.0 MHz	19.38	16.37	21.66
D	NR+LTE: QPSK	10.0+10.0 MHz	19.37	16.36	21.65
Total			25.39	22.38	27.67

### Remarks

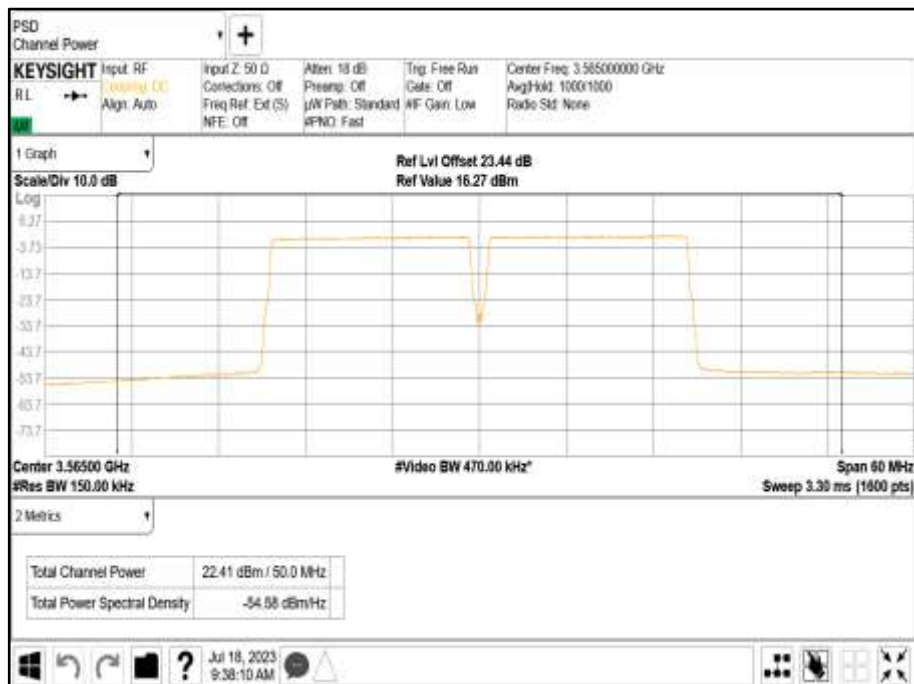
1. The table results are measured at all antenna ports.
2. The plot results represent typical radio performance across all channels.
3. Plot data performance for all transmitter ports and channels for both contiguous and non-contiguous (NC) operation are available on request.
4. All non-contiguous transmit power performance is present in the first table.
5. \* = non-contiguous configuration.



Antenna Port D Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B

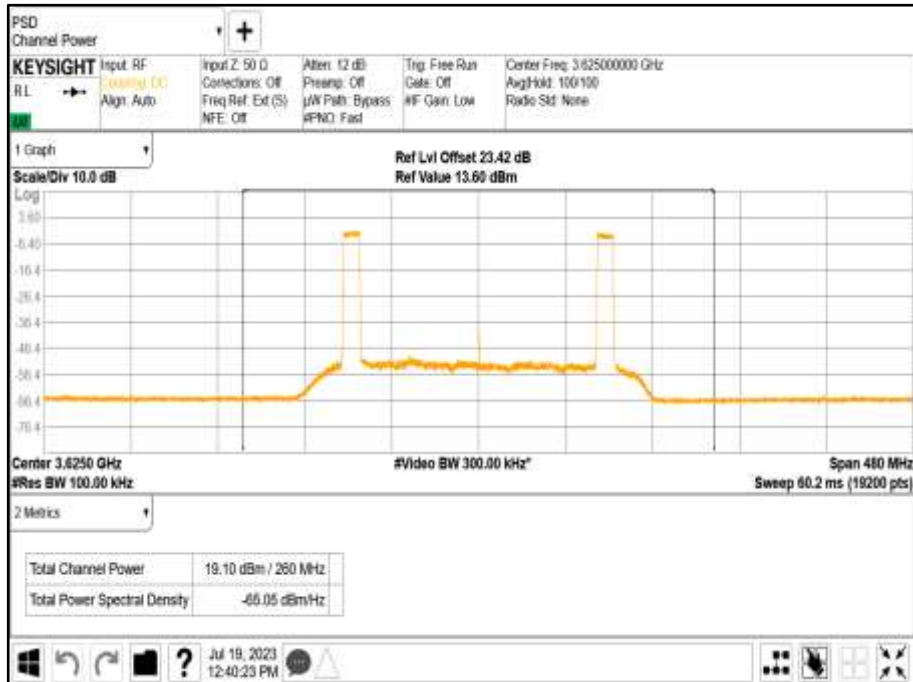


Antenna Port D Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 15.0+15.0 MHz - Channel Position B





Antenna Port D Carrier Power - Modulation \* NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B



Antenna Port D Carrier Power - Modulation \* NR: QPSK - Carrier Bandwidth 15.0+15.0 MHz - Channel Position B



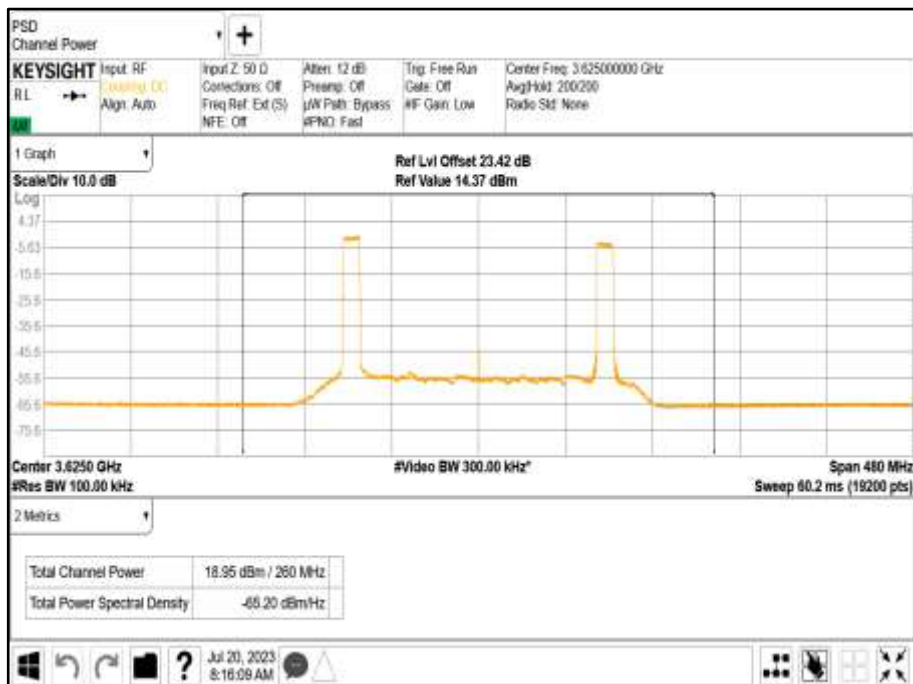




Antenna Port D Carrier Power - Modulation NR+LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B



Antenna Port D Carrier Power - Modulation \* NR+LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B















Limit	
Maximum EIRP	Category A CBSD Maximum EIRP: 30 dBm/10 MHz Maximum PSD: 20 dBm/MHz
Peak to Average Ratio	13 dB



## 2.2 OCCUPIED BANDWIDTH

### 2.2.1 Specification Reference

FCC CFR 47 Part 96, Clause 96.41 (e)(3)  
FCC CFR 47 Part 2, Clause 2.1049

### 2.2.2 Date of Test and Modification State

31-July-2023 - Modification State 0

### 2.2.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.2.4 Environmental Conditions

Ambient Temperature 24.6°C  
Relative Humidity 30.8%

### 2.2.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, Clause 4.2 and 4.3. The Spectrum Analyser RBW was configured to be at least 1% of the channel bandwidth of the carrier to be measured.

Occupied bandwidth – power bandwidth (99 %) measurement procedure  
Subclause 5.4.4 of ANSI C63.26-2015 is applicable (wherein the recommendation is to use the 99 % power bandwidth function of a spectrum analyser).

### 2.2.6 Test Results

Configuration A

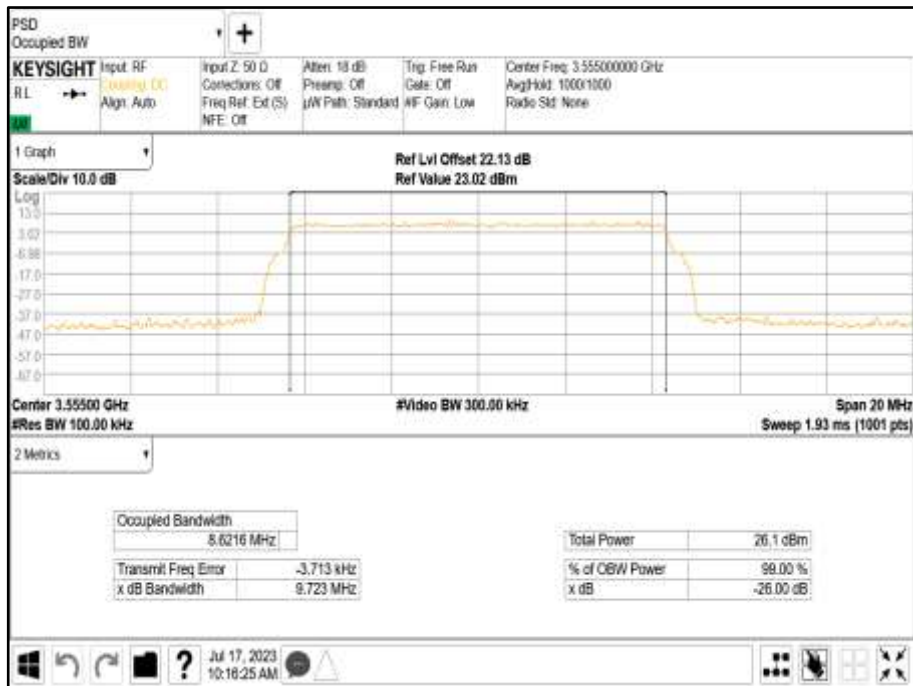
Modulation	Carrier Bandwidth	Result (MHz)
		Channel Bandwidth
		Occupied Bandwidth
NR: QPSK	NR: 10.0 MHz	8.622
NR: QPSK	NR: 15.0 MHz	13.584

#### Remarks

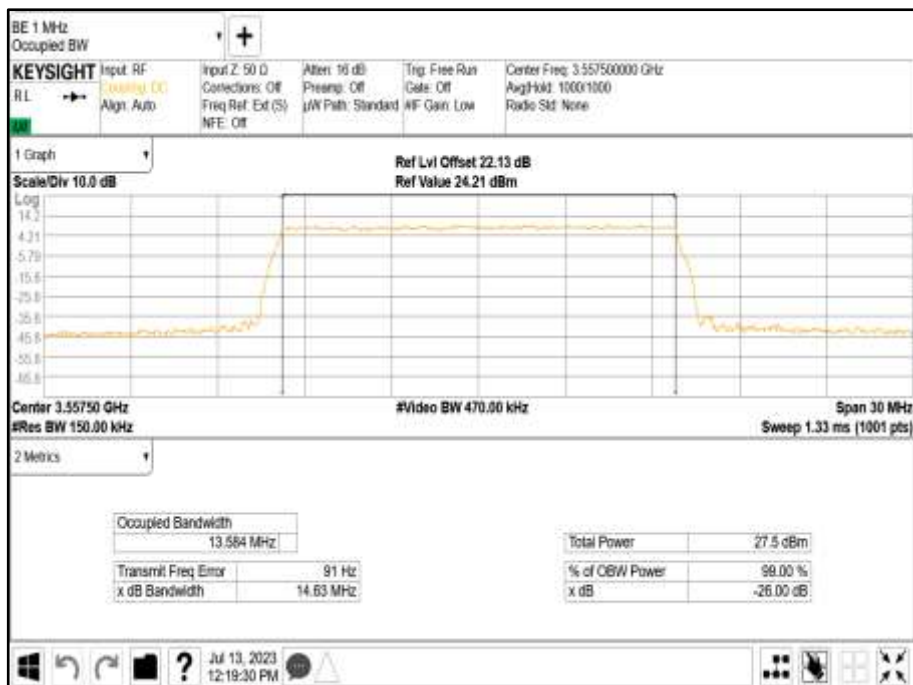
Representative occupied band width performance results presented. Plot data performance for all transmitter ports and channel positions are on file and available on request.



Antenna D - Modulation NR: QPSK - Carrier Bandwidth NR: 10.0 MHz - Channel Position B



Antenna D - Modulation NR: QPSK - Carrier Bandwidth NR: 15.0 MHz - Channel Position B





## 2.3 BAND EDGE

### 2.3.1 Specification Reference

FCC CFR 47 Part 96, Clause 96.41 (e)(3)  
FCC CFR 47 Part 2, Clause 2.1051

### 2.3.2 Date of Test and Modification State

31 July and 01-August-2023 - Modification State 0

### 2.3.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.3.4 Environmental Conditions

Ambient Temperature 24.6°C  
Relative Humidity 30.8%

### 2.3.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, Clause 6.0.

Each antenna port has been declared as being equivalent, therefore measurements were made on one antenna port only. To account for this, the limit was tightened by  $10 * \text{Log}(N)$ , where N is equal to the number of MIMO antenna ports.

For the number of antenna ports, the limit was calculated as being:  
 $-13 \text{ dBm} - 10 * \text{Log}(4) = -19 \text{ dBm}$ .

### 2.3.6 Test Results

Configuration A

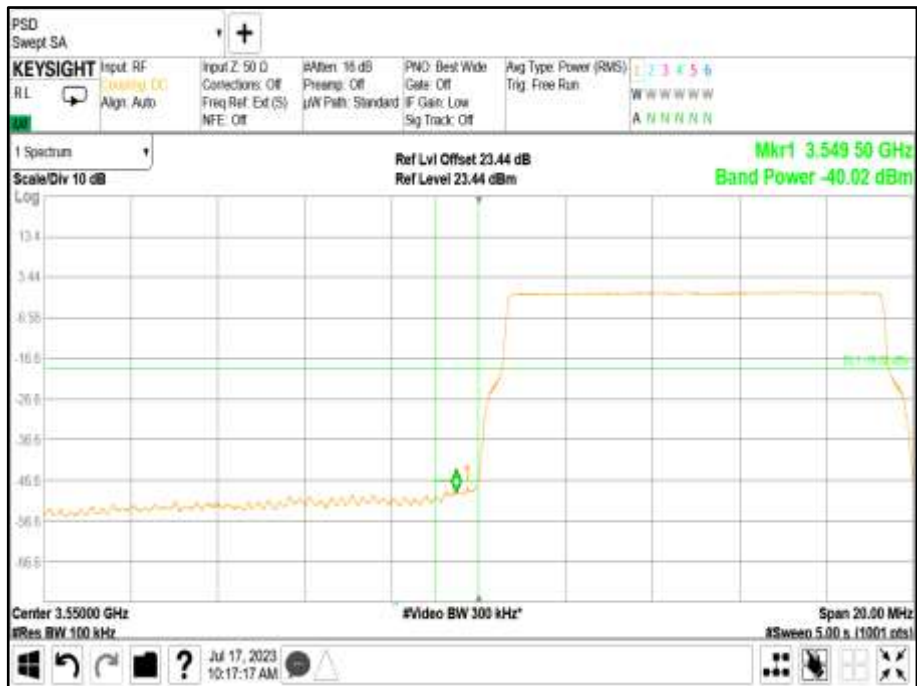
Antenna Port A	Modulation	Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
D	NR: QPSK	10.0 MHz	3,555.0	3,695.0
D	NR: QPSK	15.0 MHz	3,557.5	3,692.5

#### Remarks

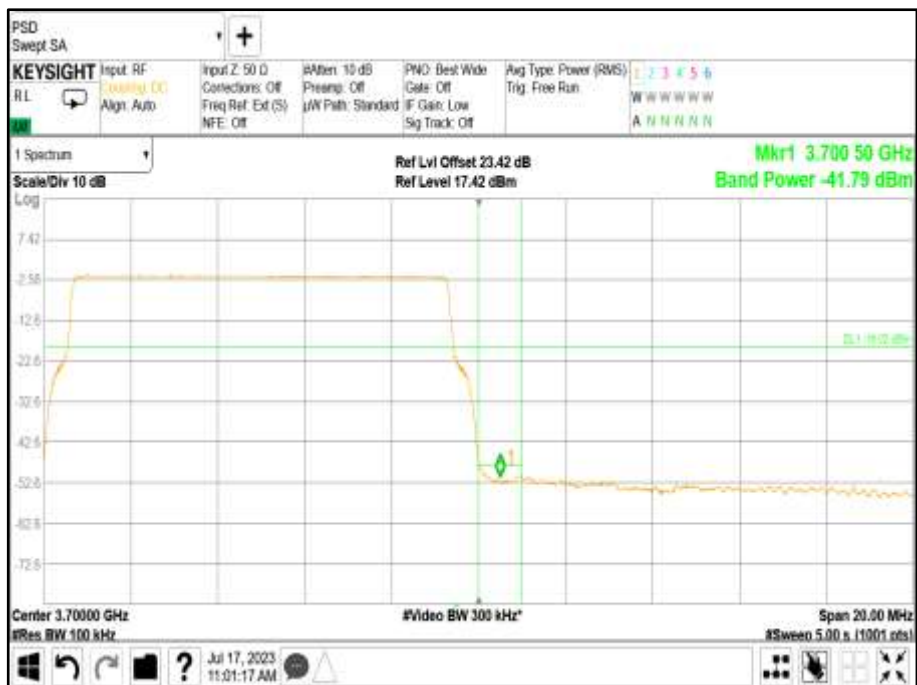
1. Band edge data was captured from the transmit port with maximum measured power.
2. Worst case band edge data presented.



Antenna Port D - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B



Antenna Port D - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position T



Antenna Port D - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B



Antenna Port D - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position T

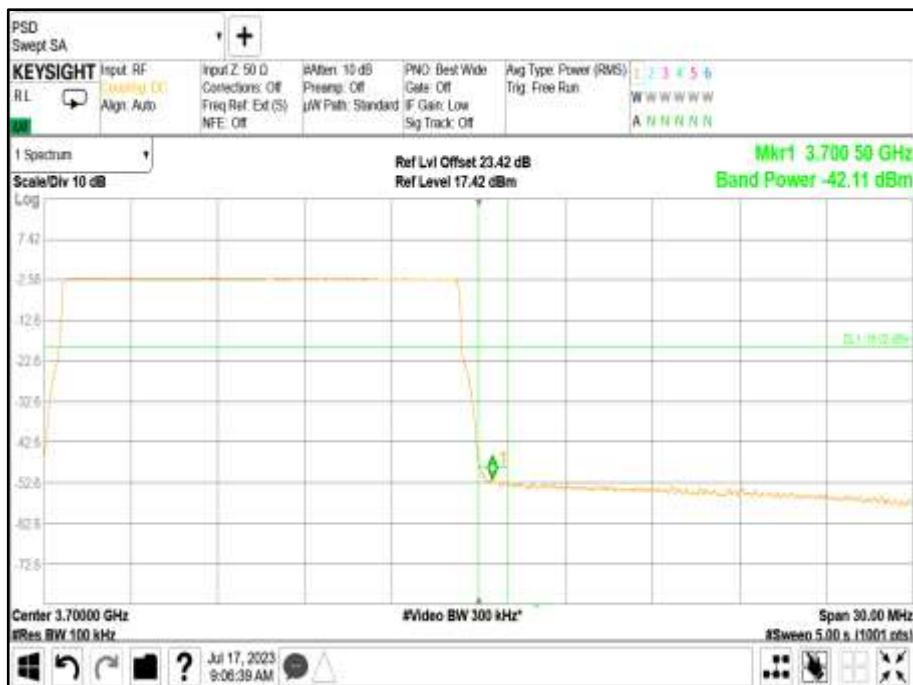




Antenna Port D - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B



Antenna Port A D - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position T



Antenna Port D - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B



Antenna Port D - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position T





Configuration B

Antenna	Modulation	Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
D	NR: QPSK	10.0+10.0 MHz	3555+3565	3685+3695
D	NR: QPSK	15.0+15.0 MHz	3557.5+3572.5	3677.5+3692.5
D	*NR: QPSK	10.0+10.0 MHz	3555+3565	3685+3695
D	*NR: QPSK	15.0+15.0 MHz	3557.5+3572.5	3677.5+3692.5
D	NR+LTE: QPSK	10.0+10.0 MHz	3555+3565	3685+3695
D	*NR+LTE: QPSK	10.0+10.0 MHz	3,555.0	3695.00

Remarks

The plots results represent typical radio performance.

Antenna Port D - Modulation NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B







Antenna Port D - Modulation NR: QPSK - Carrier Bandwidth 15.0+15.0 MHz - Channel Position B



Antenna Port D - Modulation NR: QPSK - Carrier Bandwidth 15.0+15.0 MHz - Channel Position I





Antenna Port D - Modulation \*NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B



Antenna Port D- Modulation \*NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position I







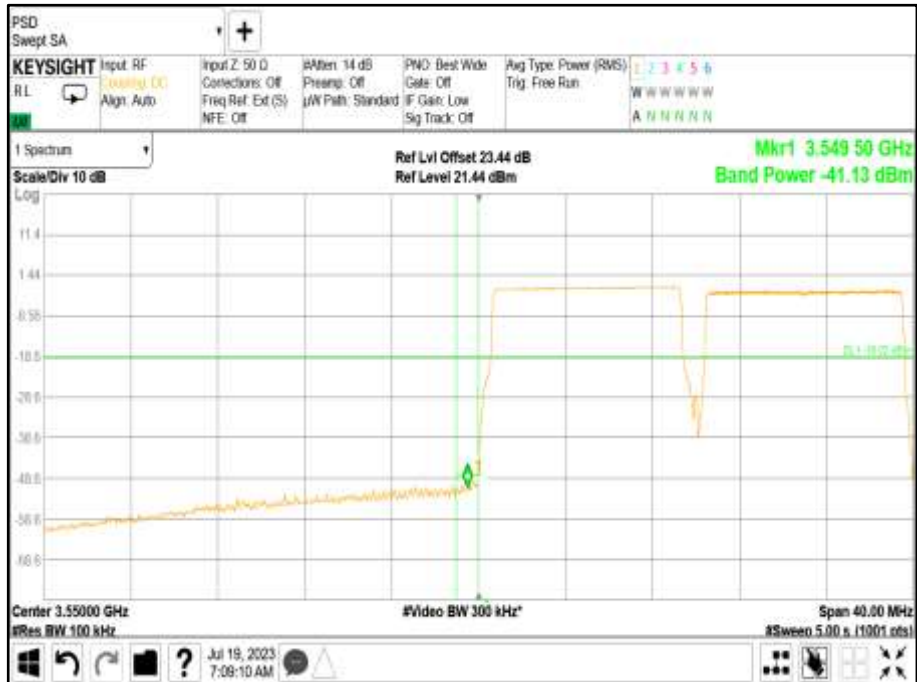
Antenna Port D - Modulation \*NR: QPSK - Carrier Bandwidth 15.0+15.0 MHz - Channel Position B



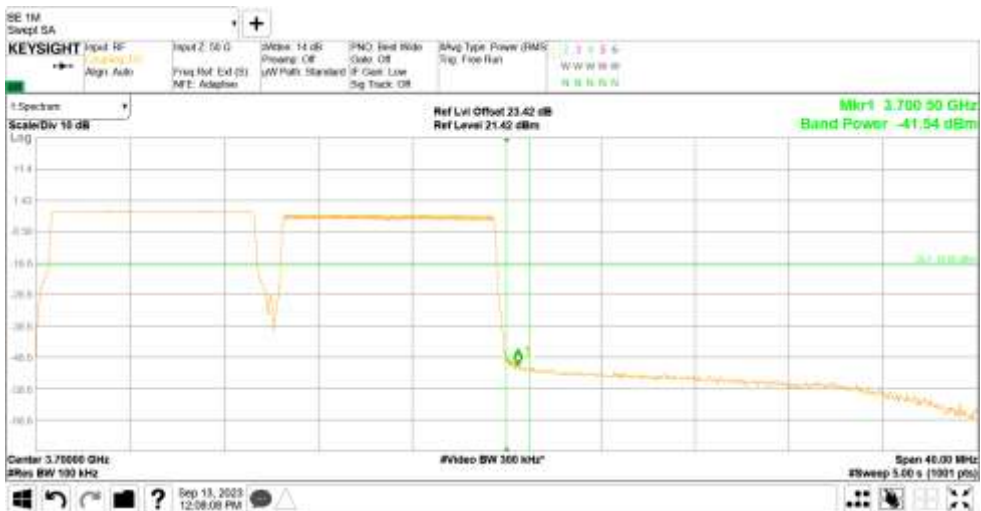
Antenna Port D - Modulation \*NR: QPSK - Carrier Bandwidth 15.0+15.0 MHz - Channel Position I



Antenna Port D- Modulation NR+LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B



Antenna Port D- Modulation NR+LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position T



Antenna Port D - Modulation \* NR+LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B



Antenna Port D - Modulation \* NR+LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position T





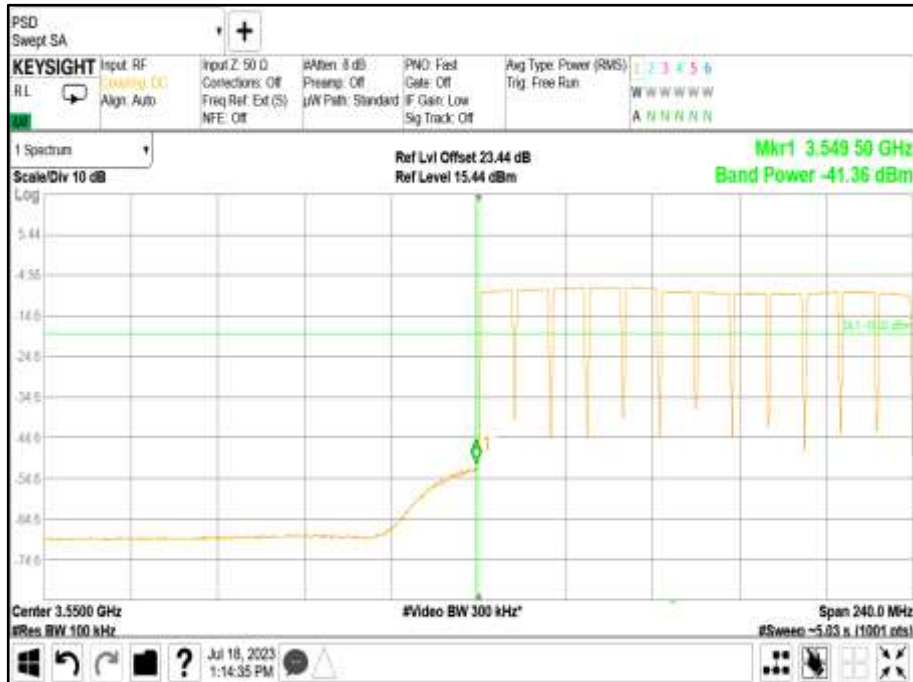
Configuration C

Antenna	Modulation	Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
D	NR 10: QPSK	10+10+10+10+10+10+	3555+3565+3575+	3585+3595+3605+
		3585+3595+3605	3615+3625+3635	3615+3625+3635
D	*NR 10: QPSK	10+10+10+10+10+10	3615+3625+3635+	3645+3655+3665+
		MHz	3645+3655+3665	3675+3685+3695
D	6NR10 + 6LTE 10: QPSK	10+10+10+10+10+10	3555+3565+3575+	3585+3595+3605+
		MHz	3615+3625+3635+	3645+3655+3665+
D	* 6NR10 + 6LTE 10: QPSK	10+10+10+10+10+10	3555+3565+3575+	3585+3595+3605+
		MHz	3615+3625+3635+	3645+3655+3665+
			3645+3655+3665+	3675+3685+3695
			3555+3565+3575+	3585+3595+3605
			3615+3625+3635+	3645+3655+3665+
			3645+3655+3665	3675+3685+3695

Remarks

The plots results represent typical radio performance.

Antenna Port D - Modulation NR 10: QPSK - Carrier Bandwidth 10+10+10+10+10+10 MHz - Channel Position B



Antenna Port D - Modulation NR 10: QPSK - Carrier Bandwidth 10+10+10+10+10+10 MHz - Channel Position T





Antenna Port D - Modulation \*NR 10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position B



Antenna Port D - Modulation \*NR 10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position T







Antenna Port D - Modulation NR10 + LTE 10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position B



Antenna Port D - Modulation NR10 + LTE 10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position T



Antenna Port D - Modulation \* NR10 + LTE 10: QPSK - Carrier Bandwidth  
10+10+10+10+10+10+ 10+10+10+10+10+10 MHz - Channel Position B



Antenna Port D - Modulation \* NR10 + LTE 10: QPSK - Carrier Bandwidth  
10+10+10+10+10+10+ 10+10+10+10+10+10 MHz - Channel Position T



Limit	-13 dBm/MHz $-10\log(4) = -19$ dBm/MHz (4 port MIMO)
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## 2.4 TRANSMITTER SPURIOUS EMISSIONS

### 2.4.1 Specification Reference

FCC CFR 47 Part 96, Clause 96.41 (e)(1)  
FCC CFR 47 Part 2, Clause 2.1051

### 2.4.2 Date of Test and Modification State

31 July, 01 and 02-August-2023 - Modification State 0

### 2.4.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.4.4 Environmental Conditions

Ambient Temperature	24.6°C
Relative Humidity	30.8%

### 2.4.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, Clause 6.1.

### 2.4.6 Test Results

Configuration A

#### Remarks

1. Transceiver spurious emissions have been searched for all channel bandwidths and antenna ports.
2. Worst-case spurious emissions performance has been presented for all modulations & bandwidths.
3. Plot data performance for all channel bandwidths, and channel positions for both contiguous and non-contiguous (NC) operation are on file and available on request.
4. Where applicable, the plot limit lines have been adjusted to reflect the integrated spurious level requirement of the defined rule part to the receiver measurement band width used.

#### **Notes:**

A 7 GHz spurious emission has been detected as significant on antenna various antenna ports. All 4 antenna ports have been re-measured for comparison against the -40dBm / MHz limit. The worst-case detected results have been entered in the tables below as well as presented in the plots.



RAT	Ch. BW (MHz)	No. of Carriers	7 GHz Spurious Emissions (2nd Harmonic) dBm				
			A	B	C	D	Total
NR	10	1	-41.71	-50.51	-53.1	-48.42	-40.19
NR	15	1	-41.97	-50.96	-52.74	-48.85	-40.46
NR	10	2	-41.68	-51.3	-51.75	-49.13	-40.26
NR	15	2	-51.75	-41.6	-51.29	-49.87	-40.29
NR	10	12	-52.89	-41.62	-53.22	-49.69	-40.48
NR+LTE	10	2	-41.81	-52.47	-52.25	-49.14	-40.47
NR+LTE	10	12	-52.13	-41.97	-53.15	-50.1	-40.74
*NR	10	2	-46.62	-43.2	-53.26	-49.67	-40.70
*NR	15	2	-46.02	-43.5	-53.2	-49.46	-40.67
*NR+LTE	10	2	-45.86	-42.81	-53.22	-49.04	-40.20
*NR	10	12	-49.6	-42.42	-53.1	-50.36	-40.84
*NR+LTE	10	12	-50	-42.13	-53.15	-50.19	-40.67

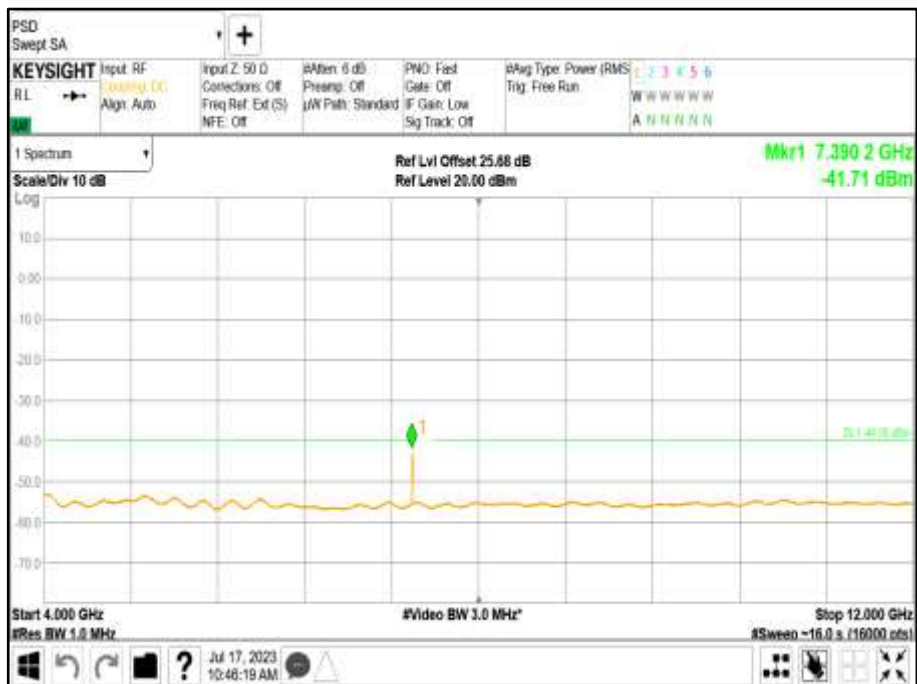
Note: \* = Non-Contiguous Configuration.



Antenna D - Modulation NR: QPSK - Carrier Bandwidth NR 10 MHz - Channel Position T - Band 1.00 - Range 0.009 to 4000 MHz



Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR 10 MHz - Channel Position T - Band 2 - Range 4000 to 12000 MHz

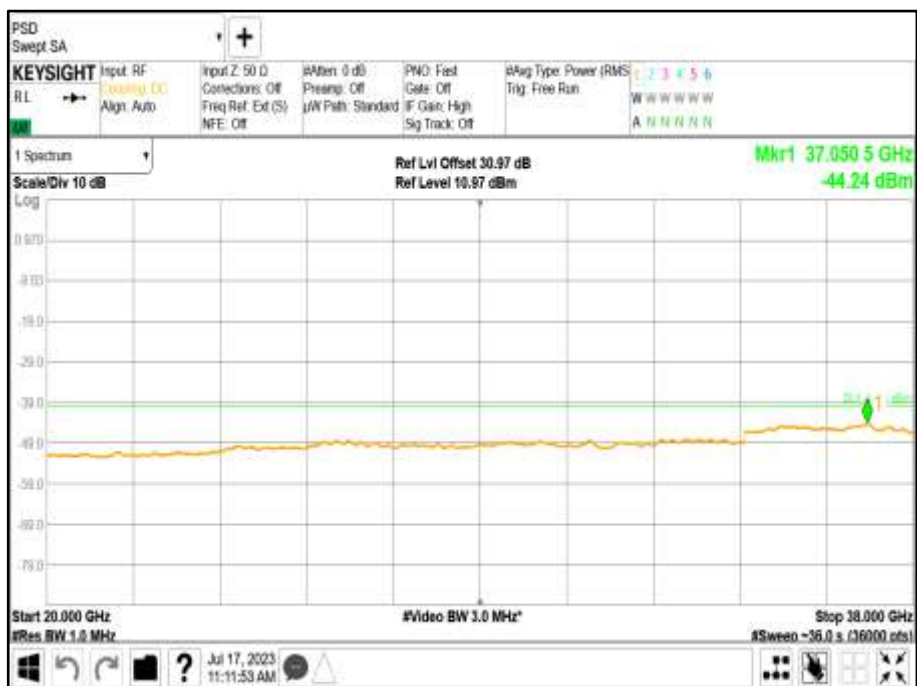




Antenna D - Modulation NR: QPSK - Carrier Bandwidth NR 10 MHz - Channel Position T - Band 3 - Range 12000 to 20000 MHz



Antenna D - Modulation NR: QPSK - Carrier Bandwidth NR 10 MHz - Channel Position T - Band 4 - Range 20000 to 38000 MHz





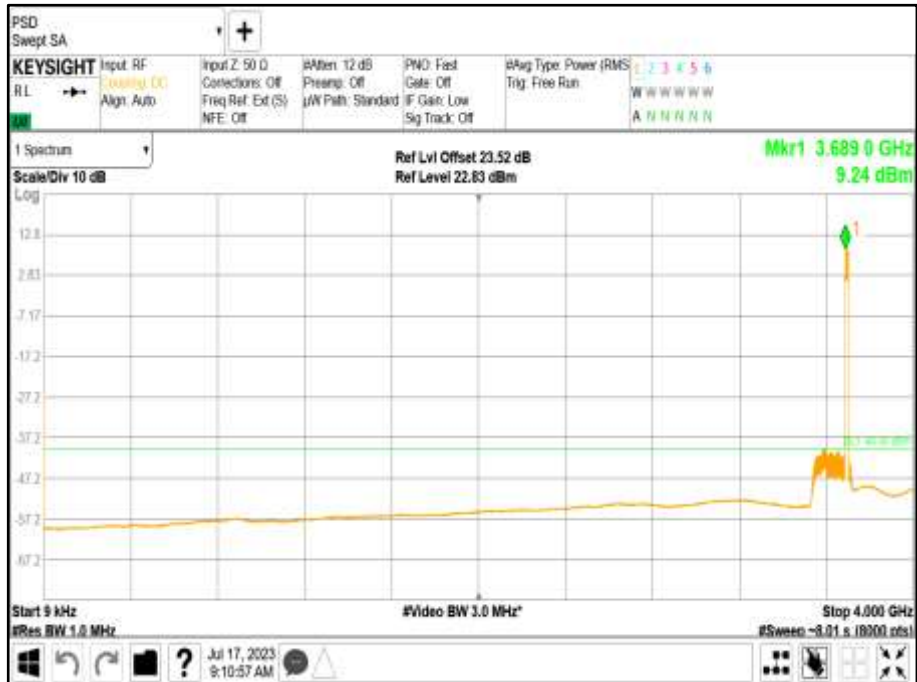
Antenna D - Modulation NR: QPSK - Carrier Bandwidth NR 10 MHz - Channel Position T - Band 1 - Range LBE Mask



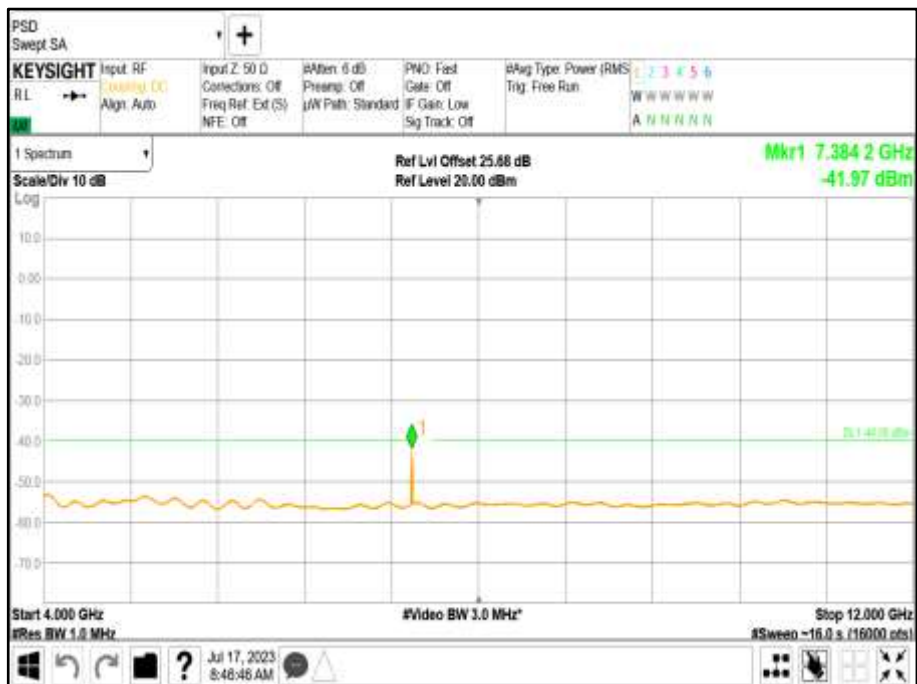
Antenna D - Modulation NR: QPSK - Carrier Bandwidth NR 10 MHz - Channel Position T - Band 1 - Range UBE Mask



Antenna D - Modulation NR: QPSK - Carrier Bandwidth NR: 15 MHz - Channel Position T - Band 1.00 - Range 0.009 to 4000 MHz



Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 15 MHz - Channel Position T - Band 2 - Range 4000 to 12000 MHz

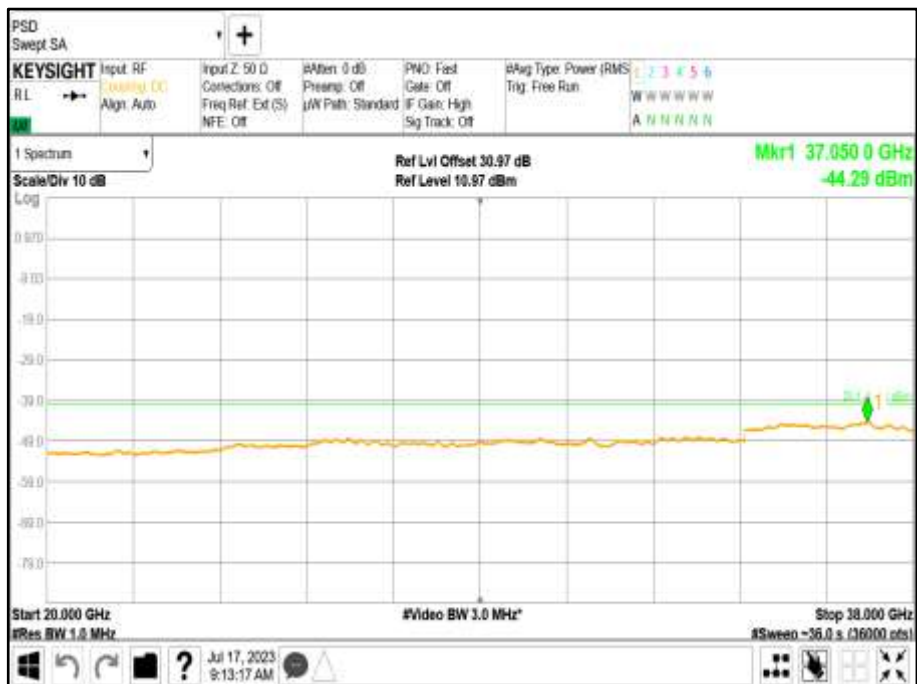




Antenna D - Modulation NR: QPSK - Carrier Bandwidth NR: 15 MHz - Channel Position T - Band 3 - Range 12000 to 20000 MHz



Antenna D - Modulation NR: QPSK - Carrier Bandwidth NR: 15 MHz - Channel Position T - Band 4 - Range 20000 to 38000 MHz







Antenna D - Modulation NR: QPSK - Carrier Bandwidth NR: 15 MHz - Channel Position T - Band 1 - Range LBE Mask



Antenna D - Modulation NR: QPSK - Carrier Bandwidth NR: 15 MHz - Channel Position T - Band 1 - Range UBE Mask





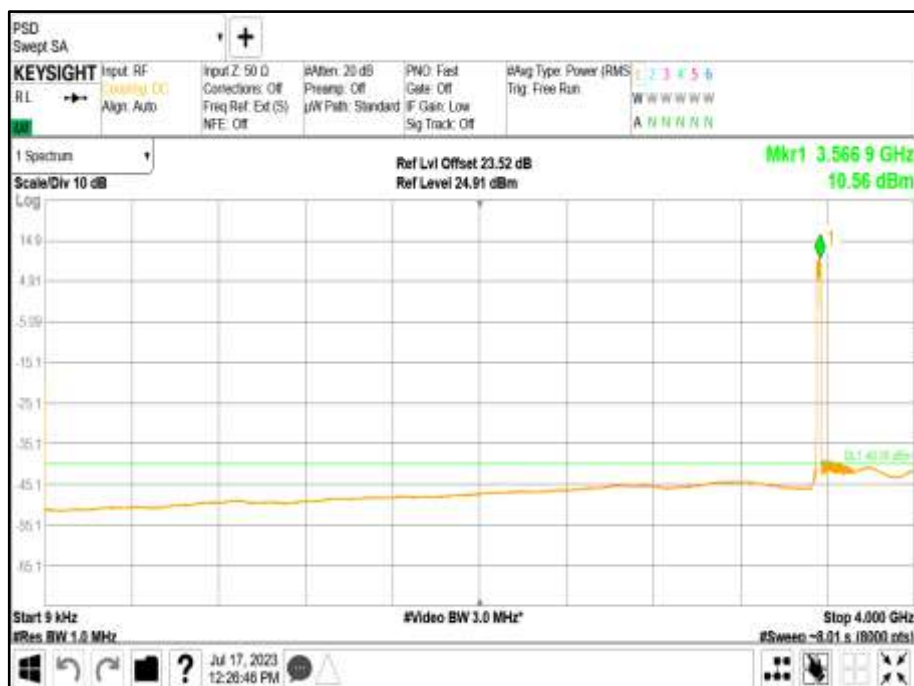


## Configuration B

### Remarks

1. Transceiver spurious emissions have been searched for all channel bandwidths and antenna ports.
2. Worst-case spurious emissions performance has been presented for all modulations.
3. Plot data performance for all channel bandwidths, and channel positions for both contiguous and non-contiguous (NC) operation are on file and available on request.

Antenna D - Modulation NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 1.00 - Range 0.009 to 4000 MHz



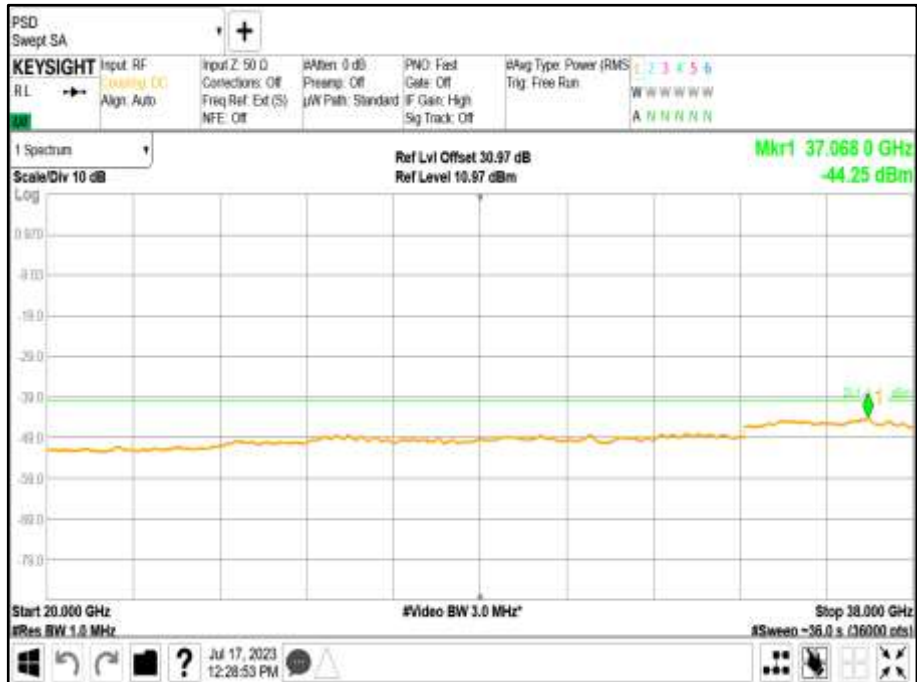
Antenna A - Modulation NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz



Antenna D - Modulation NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 3 - Range 12000 to 20000 MHz



Antenna D - Modulation NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 4 - Range 20000 to 38000 MHz



Antenna D - Modulation NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 1 - Range LBE Mask





Antenna D - Modulation NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 1 - Range UBE Mask



Antenna D - Modulation \*NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 1.00 - Range 0.009 to 4000 MHz



Antenna B - Modulation \*NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz

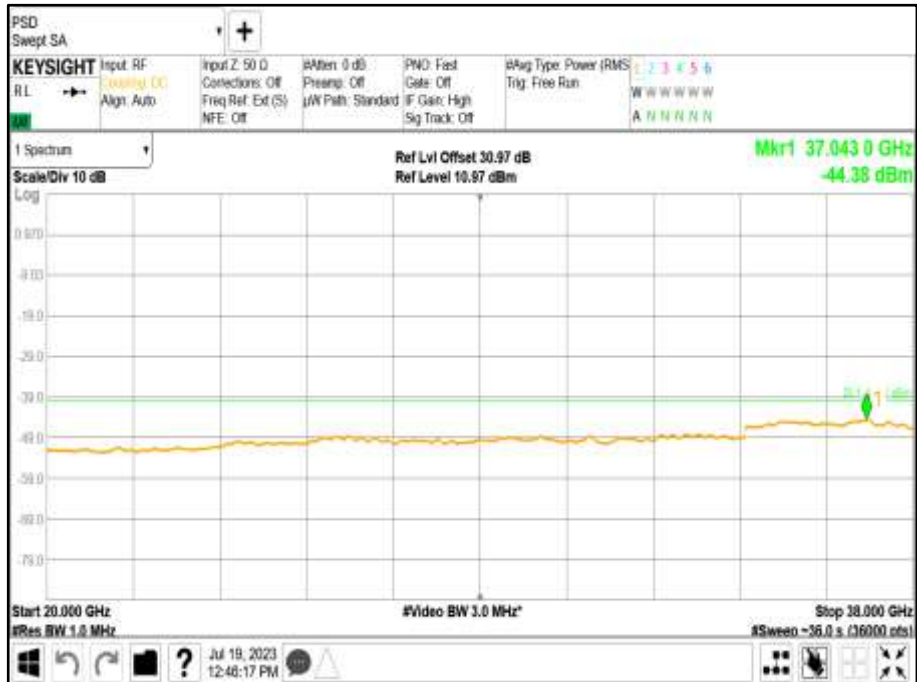


Antenna D - Modulation \*NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 3 - Range 12000 to 20000 MHz





Antenna D - Modulation \*NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 4 - Range 20000 to 38000 MHz



Antenna D - Modulation \*NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 1 - Range LBE Mask





Antenna D - Modulation \*NR: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 1 - Range UBE Mask

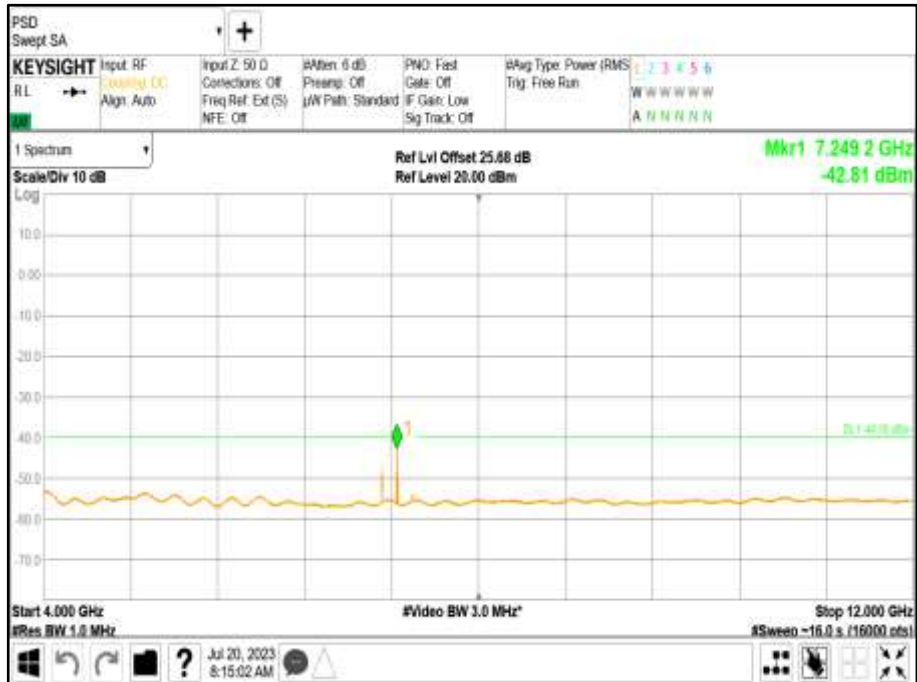


Antenna D - Modulation \*NR+LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 1.00 - Range 0.009 to 4000 MHz





Antenna B - Modulation \*NR+LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz



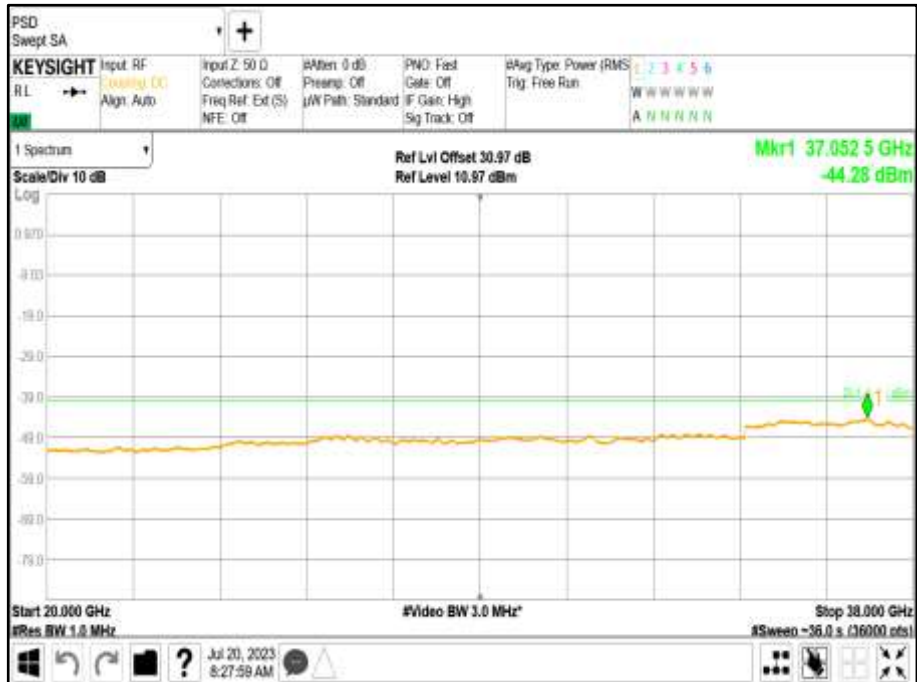
Antenna D - Modulation \*NR+LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 3 - Range 12000 to 20000 MHz







Antenna D - Modulation \*NR+LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 4 - Range 20000 to 38000 MHz



Antenna D - Modulation \*NR+LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 1 - Range LBE Mask





Antenna D - Modulation \*NR+LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B - Band 1 - Range UBE Mask





## Configuration C

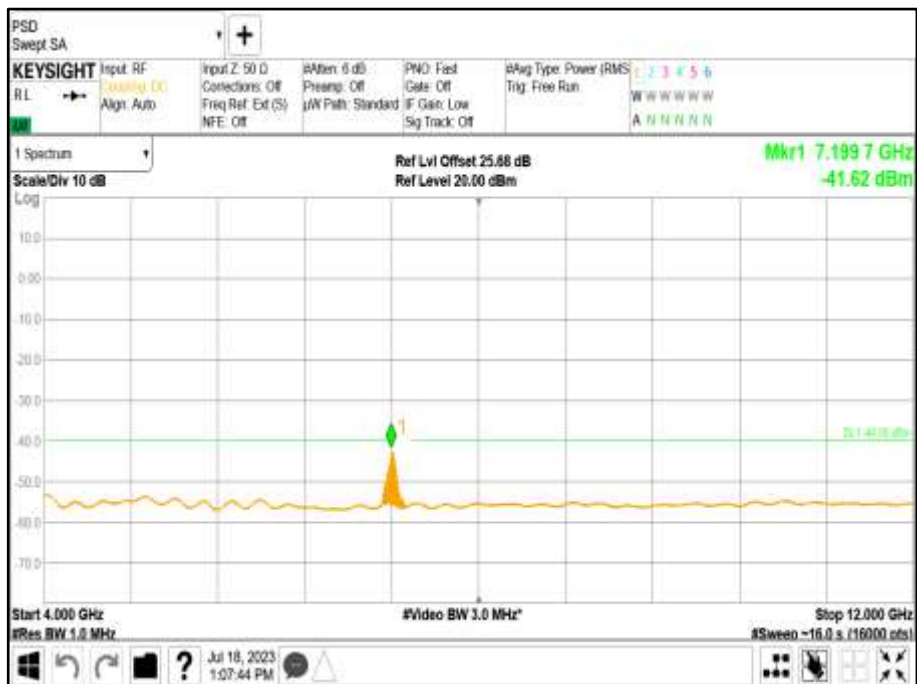
### Remarks

1. Transceiver spurious emissions have been searched for all channel bandwidths and antenna ports.
2. Worst-case spurious emissions performance has been presented for all modulations.
3. Plot data performance for all channel bandwidths, and channel positions for both contiguous and non-contiguous (NC) operation are on file and available on request.

Antenna D - Modulation NR10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position B - Band 1.00 - Range 0.009 to 4000 MHz



Antenna B - Modulation NR10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz





Antenna D - Modulation NR10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+  
10+10+10+10+10+10 MHz - Channel Position B - Band 3 - Range 12000 to 20000 MHz



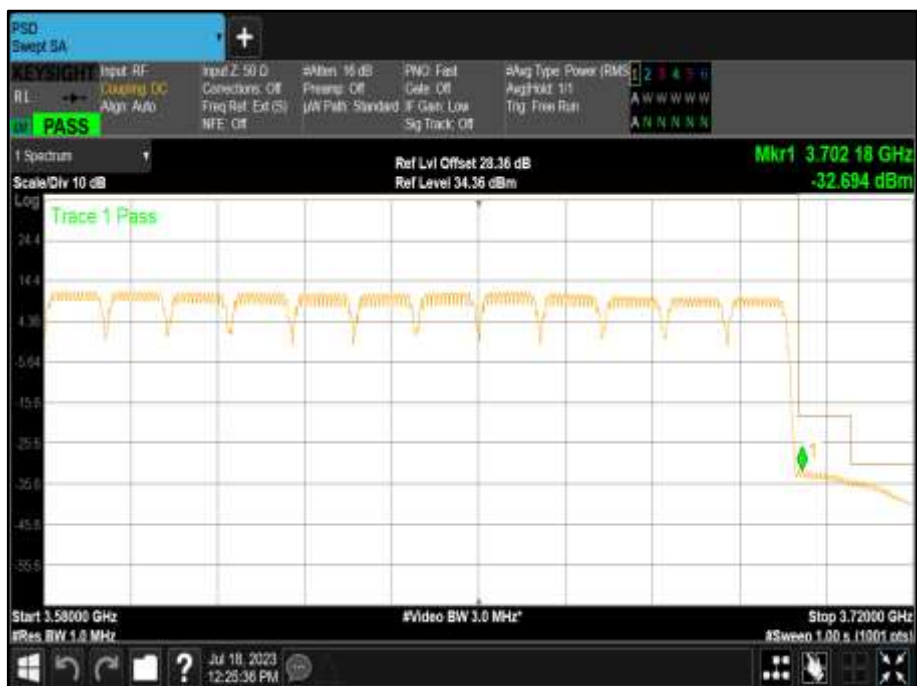
Antenna D - Modulation NR10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+  
10+10+10+10+10+10 MHz - Channel Position B - Band 4 - Range 20000 to 38000 MHz



Antenna D - Modulation NR10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position B - Band 1.00 - Range LBE Mask



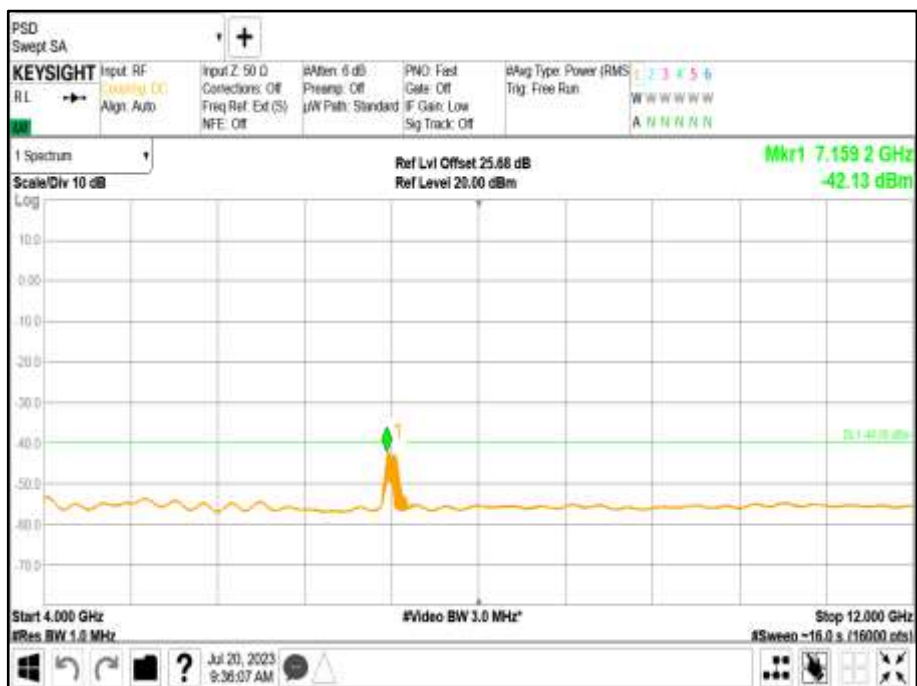
Antenna D - Modulation NR10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position B - Band 2 - Range UBE Mask



Antenna D - Modulation \* NR10 + LTE 10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position B - Band 1.00 - Range 0.009 to 4000 MHz



Antenna B - Modulation \* NR10 + LTE 10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz



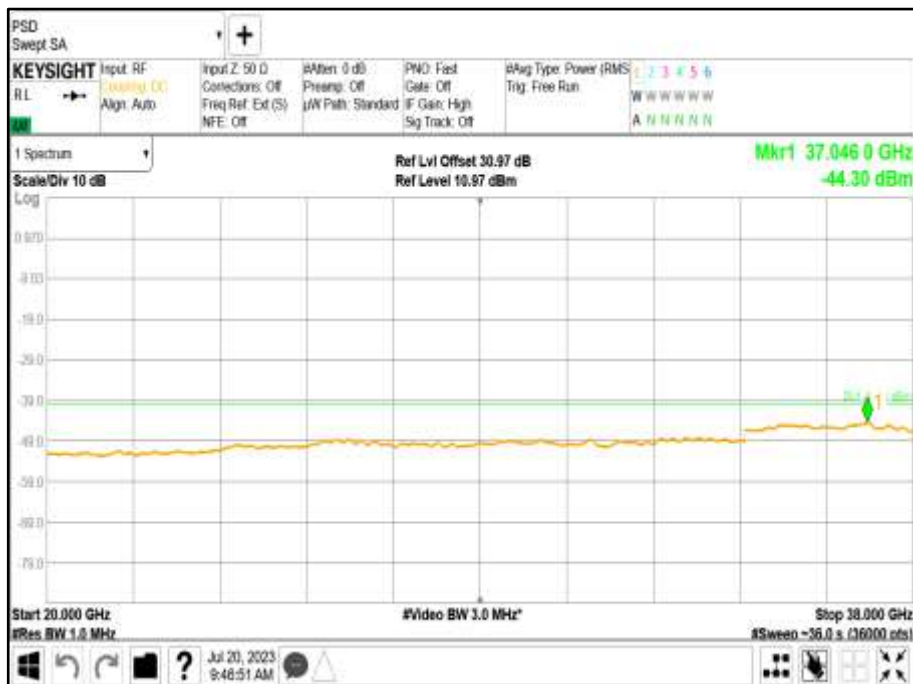




Antenna D - Modulation \* NR10 + LTE 10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position B - Band 3 - Range 12000 to 20000 MHz



Antenna A - Modulation \* NR10 + LTE 10: QPSK - Carrier Bandwidth 10+10+10+10+10+10 MHz - Channel Position B - Band 4 - Range 20000 to 38000 MHz







Antenna D - Modulation \* NR10 + LTE 10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position B - Band 1.00 - Range LBE Mask



Antenna D - Modulation \* NR10 + LTE 10: QPSK - Carrier Bandwidth 10+10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position B - Band 2 - Range UBE Mask







### **SECTION 3**

#### **TEST EQUIPMENT USED**



### 3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Keysight	PXA N9030B	MY57144347	12	30-Mar-2024
Thermometer / Refrigeration	VWR	89094-746	210697579	24	13-Aug-2023
PSU	Xantrex	XKW60-50	E00109862	N/A	O/P Mon
Attenuator (20dB)	Mini-Circuits	BW-K10-2W44+	-	N/A	O/P Mon
Climate Chamber	Burnsco	RTC-37P-3-3	07-07	N/A	O/P Mon

TU – Traceability Unscheduled

N/A – Not Applicable

O/P Mon – Output Monitored with Calibrated Equipment



### 3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU	
Conducted Maximum Peak Output Power	30 MHz to 20 GHz Amplitude	± 0.7 dB	
Conducted Emissions	30 MHz to 20 GHz Amplitude	± 2.1 dB	
Frequency Stability	30 MHz to 2 GHz	± 5.0 Hz	
Occupied Bandwidth	Up to 20 MHz Bandwidth	5 MHz Bandwidth	± 11547 Hz
		10 MHz Bandwidth	± 23094 Hz
		15 MHz Bandwidth	± 34641 Hz
		20 MHz Bandwidth	± 46188 Hz
Band Edge	30 MHz to 20 GHz Amplitude	±0.8 dB	
Radiated Spurious Emissions	30 MHz to 1 GHz	± 5.2 dB	
	1 GHz to 40GHz	± 6.3 dB	

#### Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the results of the compliance measurement and does not take into account measurement instrumentation uncertainty as defined in ANSI C63.26:2015 Clause 1.3.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8



## **SECTION 4**

### **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**



#### 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our A2LA Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our A2LA Accreditation.

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## **ANNEX A**

### **MODULE LIST**



Configuration A/B/C			
Product	Product No	R-State	Serial No
Dot 4469 B48 (EUT)	KRY 901 516/2	R1A	TD3W213280
Dot 4459 B48 (EUT *RE PSD)	KRY 901 516/1	R1A	TD3W262402
CT-DU25	LPC102500/1	R3B	T01G525053
IRU 1648 (for Contig)	KRC 161 842/1	R1D	TD3F105259
IRU 1649 (for Non-contig)	KRC 161 842/2	R1D	TD3F071564
Software:	CXP2030045/26	Revision:	R17B483

\*RE = Radiated Emissions.

This DOT was used for the 10 MHz PSD measurement only, to demonstrate compliance.